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ABSTRACT

During the year since the founding of Squibb College in 1988, the Instructional Technology department has been charged with planning and implementing information technology systems for both office productivity and training. Decisions made, obstacles encountered, and progress achieved during that year are discussed, and the impact of the first year's experiences on future decisions is described. The paper concludes by outlining major aspirations and challenges for the coming years. (3 references) (GL)

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The Corporate College: Integrating Information Technologies

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THE CORPORATE COLLEGE:
Integrating Information Technologies

Summary
During the year since the founding of Squibb College, the Instructional Technology department has been charged with planning and implementing information technology systems for both office productivity and training. Decisions made, obstacles encountered, and progress achieved during that year are described.

The impact of the first year's experiences on future decisions is discussed. Major aspirations and challenges for the coming years are also outlined.

Background
Founded in September 1988, Squibb College was created by E.R. Squibb & Sons to meet the basic training, education, and development needs of its more than 20,000 employees worldwide. The initial mission statement of the College stressed the corporation's commitment to state-of-the-art technologies.

> The Squibb College will be the corporate umbrella for all training, education and development activities worldwide.
>
> The College will initiate and design management and career development programs as well as support special focus programs related to specific business units and functional responsibilities.
>
> Squibb College will ... integrate a worldwide state-of-the-art training technology ....
>
> The College is dedicated to supporting corporate goals by meeting the learning needs of its employees, enabling them to innovate and excel ....

-- Squibb College Mission Statement, 1988

Instructional Technology
To help fulfill that mission, the College established the Instructional Technology department, the first such function in the corporation. The mission of Instructional Technology is to serve the instructional

systems development (ISD) needs of the College's curricular departments, such as Career/ Management Development. We also provide ISD services to various units outside the College organization, such as Pharmaceutical Group Sales Training.

Prior to the advent of the Instructional Technology department, training program directors had relied on external vendors and consultants for all training product development and for most design and delivery requirements. There had been no internal instructional developers and, thus, were no ISD tools. The new department was starting "from scratch."

The Technology Challenge

The Instructional Technology department did not really launch its activities until January 1989, just after Squibb College moved into a renovated training facility north of Princeton, New Jersey. At that time, we were assigned the task of integrating information technologies into the training development and delivery processes at Squibb College.

The creators of Squibb College agreed with Weiss and Birnbaum that "technical infrastructure is as important as communications and transportation in constraining or facilitating business activity" (1989, p.1015). Thus, because we were "the technology people" for the College, coordinating the selection and implementation of office automation systems was also among the responsibilities given to Instructional Technology.

Integrating Technologies for Productivity

When Squibb College first moved into its facility, fewer than half of the staff of 20 was equipped with an office microcomputer. The rest of the staff were recently hired to fill brand-new positions and, thus, brought no computing resources with them. Therefore, the first major challenge for the Instructional Technology group was to select and provide essential productivity tools for all College personnel, ensuring insofar as possible that the tools we chose would serve the College well for up to three years.

Decisions

> Long-range planning does not deal with future decisions, but with the future of present decisions.
>
> -- Peter Drucker

It was immediately evident that much time, energy, and paper could be saved by linking everyone through a local-area network (LAN). For example, we estimated a time saving of 70% in scheduling meetings alone, through the use of the "Scheduler" feature of WordPerfect Office, the corporate standard for LAN-based menu interface.

Hardware decisions were fairly easy, because few options were available to us within the limits of the corporate standards laid down by Squibb's Information Resources group. For example, the LAN specifications were predetermined. We did select a basic desktop system for each staff member and, for users whose activities demand greater computing power or greater variety of capabilities, a range of options. All of these hardware selections are shown in Table 1.

(Table 1 about here)

Based on a careful task analysis of Squibb College activities, standard, LAN-based, productivity software was selected from those packages formally approved as corporate standards. This was a more difficult, more time-consuming analysis, encompassing as it did several departments varying greatly in the complexity of their needs. The range of basic software purposes, our selected tools, and typical College applications are summarized in Table 2.

(Table 2 about here)

Implementation

> The art of progress is to preserve order amid change and to preserve change amid order.
>
> -- Alfred North Whitehead

Because of Squibb's extensive request-approval-implementation process, we implemented our productivity

technologies in two manageable, orderly phases: first, stand-alone systems; second, the LAN.

Implementing stand-alone systems first allowed College personnel to begin learning fundamental computer operations and software packages almost immediately, so that they could become productive quickly. To avoid unnecessary duplication of expenditures for both single-user and network versions of software, at this stage we provided single-user copies of only the most basic software packages - WordPerfect, Lotus 1-2-3, and a few special packages for certain users.

As it happened, our implementation plan was fortuitous. A sequence of approval delays pushed the implementation of the LAN back to December 1989/January 1990. Had we elected to implement the network immediately, we might have been without computational power for a year!

Integrating Technologies for Training

The second major challenge for Instructional Technology was planning and implementing the rational integration of technologies into training curricula, with particular emphasis on Pharmaceutical Group Sales Training.

Decisions

In the beginning, most instruction at Squibb College was traditional "stand-up" training, using flipcharts, overhead and slide projectors, and linear videotapes. Trainers had occasionally employed a variety of other technologies: optical scanners, interactive keypads, computer-based testing. Sales trainers, in particular, were pleased with the versatility provided by computer-controlled media, and were eager to integrate additional innovative technologies into their training programs.

Of all instructional technologies available early in 1989, the greatest learning gains and instructional variety were achievable through interactive videodisc. Information Resources had a corporate standard for that, too: IBM InfoWindow units using SONY LDP-2000 laser videodisc players. We therefore designed an Interactive Learning Center at Squibb College that would consist of eight to twelve networked IBM PS/2 Model 50Zs, with InfoWindow touch-screen monitors and SONY videodisc players. Other peripherals, such as videotape players and interactive keypads would be controlled, as desired, by the PS/2 computers.

Dissemination of independent-study programs to employees at other Squibb sites was also a concern for Instructional Technology. We recommended that each sales distribution center and each major employee center in the USA be provided with two InfoWindow units that would run the programs we were creating.

Squibb's European operations, however, could not use IBM InfoWindow systems, because the NTSC video convention used in the USA is incompatible with the PAL and SECAM video conventions used in Europe. For these operations, we were initially forced to consider transferring programs to other media, such as simple computer-based training or linear videotape. Fortunately, dual-standard interactive systems are now available, so the sharing of training programs with our colleagues is no longer an insurmountable problem.

The selection of ISD software has been more difficult. Certainly, our choice of delivery system somewhat limited our software options. Early in 1989, only InfoWindow Presentation System (IWPS) and Learning System 1 (LS/1) authoring systems were available for IBM InfoWindow (of these two, we preferred IWPS, although neither met our needs).

Also limiting were the software choices made by the vendors who created programs for Squibb College, because we would have to be able to revise and update such programs. For example, an extensive computer-based testing program was prepared using TenCore; a career development program was created using Summit; an employee information program was designed with IWPS. We realized that we would have to purchase all of these authoring systems (for maintenance), as indicated in Table 3.

(Table 3 about here)

As the number and capabilities of authoring systems has increased, Instructional Technology's task has become simultaneously easier and more difficult. We can now find authoring systems with the functions we desire; however, these systems may not run on our corporate standard hardware. We are still evaluating authoring software ... and will probably be doing so for yet another year!

Implementation

Late in 1988, Pharmaceutical Group Sales Training had purchased five InfoWindow units (with IBM AT

microcomputers). These units formed the foundation of the Squibb College Interactive Learning Center. To these, Instructional Technology added six InfoWindow units (with IBM PS/2 microcomputers), one of which was ear-marked for ISD work. Our hopes to network the units have not yet been realized, nor have funds been available to purchase units for other sites. Programs available in the Interactive Learning Center for independent study are now fully employed throughout Pharmaceutical Group Sales Training. These include computer-based testing and games, sales and patient-management simulations, and complex videodisc-based instructional programs. In addition, interactive keypads, interactive games, and videodisc-based simulations have been integrated into classroom training.

Although most training is still conducted in the traditional manner, we are pleased that the integration of technologies into training at Squibb College has not stopped with Sales Training. Our Orientation Program for New Employees now encompasses an interactive-videodisc program, "Orientation to Squibb Cardiovascular Products." This two-hour program is available on InfoWindow units that we have provided at five Squibb locations in addition to the College itself. To accomplish this, we transferred the five original InfoWindow units to other sites, leaving just the six "new" units at the College.

Our colleagues in Europe have received little help from us so far. However, they are evaluating the comprehensive computer-based testing program, with the intention of translating it into French, German, and Italian. The adoption or adaptation of other individualized programs is awaiting the availability of the new dual-standard systems.

Information Technologies and Future College Operations

In October 1989, E.R. Squibb & Sons merged with Bristol-Myers Company to form Bristol-Myers Squibb Company, the second-largest pharmaceutical company in the world. A merger of this magnitude provides extraordinary business opportunities for a corporation, but also brings reorganization and redefinition of roles within the corporation.

Instructional Technology's Role in the New Corporation

> The new circumstances under which we are placed call for new words, new phrases, and for the transfer of old words to new objects.

-- Thomas Jefferson

As of this writing (January 1990), the role of Squibb College (likely to be called "Bristol-Myers Squibb College") within the new corporation has not been finalized. Undoubtedly, we will retain some aspects of our former mission, but different areas of responsibility may be included. Instructional Technology will continue to contribute to the achievement of the College's mission.

We will likely de-emphasize technological innovation during the coming year, in favor of assessing the effectiveness of current practices. During this period, we will have the time to achieve benefits from the decisions and investments we have already made, and to make maximum use of those productivity and development tools we now possess.

Productivity

In the area of office automation, implementation of the LAN will allow the College to realize the productivity gains Instructional Technology promised would come about through the use of Scheduler, e-mail, and shared files.

We will fully implement desktop publishing for the first time, producing manuals and newsletters in-house. And will produce most of our own business graphics for overhead transparencies and reports.

Disseminating Training

It will continue to be very important that we disseminate training products to corporate locations throughout the USA and Europe, especially to Sales Training groups. However, we will concentrate on less expensive, more portable technologies than IBM InfoWindow has proven to be.

The technologies we currently favor for the coming years are: audiotape, videotape, computer-based training/testing, and compact-disc interactive systems (using Digital Video Interactive technology). With

these, Instructional Technology can still achieve our instructional goals, but gain levels of acceptance and implementation that eluded us this past year.

The seasons have changed
And the light
And the weather
And the hour.
But it is the same land.
And I begin to know the map
And to get my bearings.

-- Dag Hammarskjöld; August 24th, 1961

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Peter, L.J. (1977). Peter's quotations: Ideas for our time. New York: Bantam Books.

Weiss, A.R., & Birnbaum, P.H. (1989). Technological infrastructure and the implementation of technological strategies. Management Science, 35, 1014-1026.

Lan Specifications:

IBM Token Ring LAN
STF Netware 286, v.2.15
Proteon Intelligent Multistation Access Units
Microcom QX/V.32C Modem
HP LaserJet IID Printers
HP Color Plotter

Basic Desktop System:

IBM PS/2 Model 50Z, with 30 MB hard disk
and 1.44 MB 3½-inch disk drive
IBM 8512 VGA Monitor
Intel 80287 Math Coprocessor

Hardware Options (for more sophisticated applications):

IBM PS/2 Model 80, with 115 MB hard disk
and 1.44 MB 3½-inch disk drive
IBM 8514/A VGA Monitor
Intel 80387 Math Coprocessor
Microsoft 2-button Mouse
Hayes SmartModem 2400, with SmartCom II
HP LaserJet II Printer
HP DeskJet Printer

TABLE 1 College Hardware Systems

Purpose	Tools	Applications
Word processing	WordPerfect, v.5.1, with Bitstream fonts and clip art	Correspondence and documents, including macros; desktop publishing
Financial analysis	Lotus 1-2-3, v.3.0	Budgets; data display
Data storage and retrieval	dBASE IV	Vendor information system
Graphics	Freelance Plus, v.3.0	Overhead transparencies; desktop publishing
Project management	TimeLine, v.3.0	Project management; load analysis
Communications	Smartcom II, v.3.0	BBS access; BITNET communications
Utilities	WordPerfect Office	Appointment calendars; meetings scheduling; e-mail; simple databases; file management; "to-do" lists; calculator

TABLE 2 Productivity Software

Purpose	Tools	Applications
Student registration, administration	Registrar/N, with Accountant, Scheduler, Historian/N, T&D Analyzer	Registration; delivery costs; course and room scheduling; student records
Testing	TenCore, Multi-Survey/Feud/ Pursuit	Computer-based testing and games
Authoring	IWPS; Summit	Interactive training programs
	Shell	Employee information programs

TABLE 3 Training Software

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U.S. Dept. of Education

Office of Education
Research and
Improvement (OERI)

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Date Filmed

March 21,1991